

REMARKS

The instant application relates in part to improved polyamides that bind to the minor groove of duplex DNA molecules. In particular, the instant claims relate to polyamides comprising a hairpin loop derived from (R)-2,4-diaminobutyric acid. Applicants respectfully request reconsideration of the present application in view of the foregoing amendments and the following remarks.

Claims 1-19, 22 and 26-38 are currently pending in the instant application. In Paper No. 25, claims 1-15, 22, and 26-38 have been allowed, and claims 26-39 have been objected to as allegedly being in improper form. In a telephonic discussion held November 11, 2002, the Examiner indicated that this objection actually extends to claim 27-38 as well.

Claims 16-19 and 27-38 have been amended herein by replacing a reference to a preceding claim with the actual language of the preceding claim. The amendments are intended solely to comply with the Examiner's request to correct the alleged improper form of the claims. The amended claims are commensurate in scope with the originally filed claims, and the amendments herein should not be taken to further limit the claims.

In view of the foregoing amendments and remarks, Applicants respectfully submit that the pending claims are in condition for allowance. An early notice to that effect is earnestly solicited. Should any matters remain outstanding, the Examiner is encouraged to contact the undersigned at the telephone number listed below so that they may be resolved without the need for additional action and response thereto.

Respectfully submitted,

Date November 12, 2002

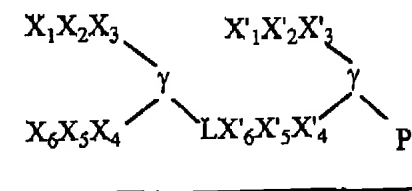
By 

FOLEY & LARDNER
P.O.Box 80278
San Diego, California 92138
Telephone: (858) 847-6700
Facsimile: (858) 792-6773

For Richard J. Warburg,
Michael A. Whittaker
Attorney for Applicant
Registration No. 46,230

Appendix A: Marked-up claims, indicating amendments.

16. (Twice amended) A tandem-linked polyamide of claim [8,] 1 having the formula:



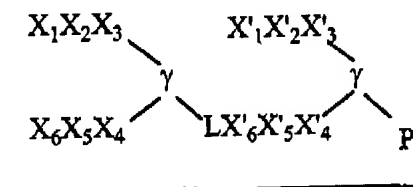
wherein γ is a chiral hairpin linkage derived from R-2,4-diaminobutyric acid;

X_1/X_6 , X_2/X_5 , X_3/X_4 , X'_1/X'_6 , X'_2/X'_5 , and X'_3/X'_4 represent six carboxamide binding pairs which bind DNA base pairs wherein at least one binding pair is Hp/Py or Py/Hp and the other binding pair(s) is(are) selected from the group consisting of Py/Im, Im/Py, and Py/Py to correspond to the DNA base pair in the minor groove to be bound;

L represents an amino acid linking group selected from the group consisting of β -alanine and 5-aminovaleric acid (δ); and

wherein P represents zero to eight polyamides of claim 1.

17. (Twice amended) A tandem-linked polyamide of claim [8,] 1 having the formula:



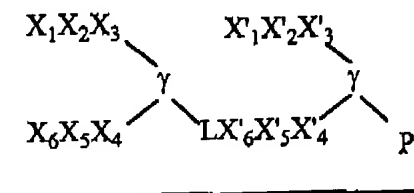
wherein γ is a chiral hairpin linkage derived from R-2,4-diaminobutyric acid;

X_1/X_6 , X_2/X_5 , X_3/X_4 , X'_1/X'_6 , X'_2/X'_5 , and X'_3/X'_4 represent six carboxamide binding pairs which bind DNA base pairs wherein at least one binding pair is Hp/Py or Py/Hp and the other binding pair(s) is(are) selected from the group consisting of Py/Im, Im/Py, and Py/Py to correspond to the DNA base pair in the minor groove to be bound;

L represents an amino acid linking group selected from the group consisting of β -alanine and 5-aminovaleric acid (δ); and

wherein P represents zero to six polyamides of claim 1.

18. (Twice amended) A tandem-linked polyamide of claim [8,] 1 having the formula:



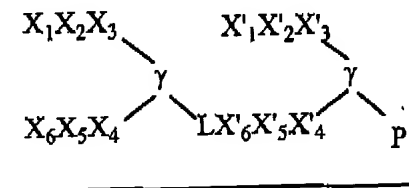
wherein γ is a chiral hairpin linkage derived from R-2,4-diaminobutyric acid:

X_1/X_6 , X_2/X_5 , X_3/X_4 , X'_1/X'_6 , X'_2/X'_5 , and X'_3/X'_4 represent six carboxamide binding pairs which bind DNA base pairs wherein at least one binding pair is Hp/Py or Py/Hp and the other binding pair(s) is(are) selected from the group consisting of Py/Im, Im/Py, and Py/Py to correspond to the DNA base pair in the minor groove to be bound;

L represents an amino acid linking group selected from the group consisting of β -alanine and 5-aminovaleric acid (δ); and

wherein P represents zero to four polyamides of claim 1.

19. (Twice amended) A tandem-linked polyamide of claim [8,] 1 having the formula:



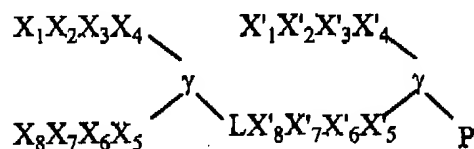
wherein γ is a chiral hairpin linkage derived from R-2,4-diaminobutyric acid:

X_1/X_6 , X_2/X_5 , X_3/X_4 , X'_1/X'_6 , X'_2/X'_5 , and X'_3/X'_4 represent six carboxamide binding pairs which bind DNA base pairs wherein at least one binding pair is Hp/Py or Py/Hp and the other binding pair(s) is(are) selected from the group consisting of Py/Im, Im/Py, and Py/Py to correspond to the DNA base pair in the minor groove to be bound;

L represents an amino acid linking group selected from the group consisting of β -alanine and 5-aminovaleric acid (δ); and

wherein P represents zero to two polyamides of claim 1.

27. (Amended) A tandem-linked polyamide of claim [9,] 1 having the formula:



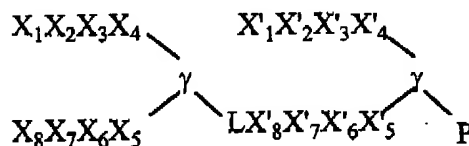
wherein γ is a chiral hairpin linkage derived from R-2,4-diaminobutyric acid;

X_1/X_8 , X_2/X_7 , X_3/X_6 , X_4/X_5 , X'_1/X'_8 , X'_2/X'_7 , X'_3/X'_6 , and X'_4/X'_5 represent eight carboxamide binding pairs which bind DNA base pairs wherein at least one binding pair is Hp/Py or Py/Hp and the other binding pair(s) is(are) selected from the group consisting of Py/Im, Im/Py, and Py/Py to correspond to the DNA base pair in the minor groove to be bound;

L represents an amino acid linking group selected from the group consisting of β -alanine and 5-aminovaleric acid (δ), and

wherein P represents zero to eight polyamides of claim 1.

28. (Amended) A tandem-linked polyamide of claim [9,] 1 having the formula:



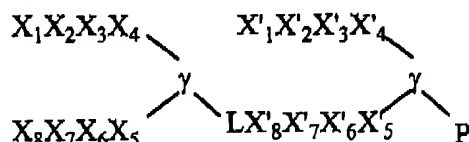
wherein γ is a chiral hairpin linkage derived from R-2,4-diaminobutyric acid;

X_1/X_8 , X_2/X_7 , X_3/X_6 , X_4/X_5 , X'_1/X'_8 , X'_2/X'_7 , X'_3/X'_6 , and X'_4/X'_5 represent eight carboxamide binding pairs which bind DNA base pairs wherein at least one binding pair is Hp/Py or Py/Hp and the other binding pair(s) is(are) selected from the group consisting of Py/Im, Im/Py, and Py/Py to correspond to the DNA base pair in the minor groove to be bound;

L represents an amino acid linking group selected from the group consisting of β -alanine and 5-aminovaleric acid (δ), and

wherein P represents zero to six polyamides of claim 1.

29. (Amended) A tandem-linked polyamide of claim [9,] 1 having the formula:



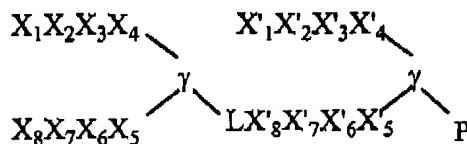
wherein γ is a chiral hairpin linkage derived from R-2,4-diaminobutyric acid;

X_1/X_8 , X_2/X_7 , X_3/X_6 , X_4/X_5 , X'_1/X'_8 , X'_2/X'_7 , X'_3/X'_6 , and X'_4/X'_5 represent eight carboxamide binding pairs which bind DNA base pairs wherein at least one binding pair is Hp/Py or Py/Hp and the other binding pair(s) is(are) selected from the group consisting of Py/Im, Im/Py, and Py/Py to correspond to the DNA base pair in the minor groove to be bound;

L represents an amino acid linking group selected from the group consisting of β -alanine and 5-aminovaleric acid (δ), and

wherein P represents zero to four polyamides of claim 1.

30. (Amended) A tandem-linked polyamide of claim [9,] 1 having the formula:



wherein γ is a chiral hairpin linkage derived from R-2,4-diaminobutyric acid;

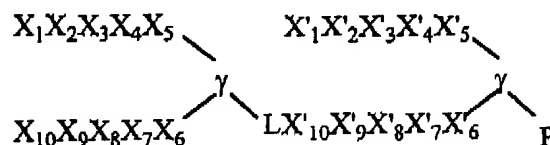
X_1/X_8 , X_2/X_7 , X_3/X_6 , X_4/X_5 , X'_1/X'_8 , X'_2/X'_7 , X'_3/X'_6 , and X'_4/X'_5 represent eight carboxamide binding pairs which bind DNA base pairs wherein at least one binding pair is Hp/Py or Py/Hp and the other binding pair(s) is(are) selected from the group consisting

of Py/Im, Im/Py, and Py/Py to correspond to the DNA base pair in the minor groove to be bound;

L represents an amino acid linking group selected from the group consisting of β -alanine and 5-aminovaleric acid (δ), and

wherein P represents zero to two polyamides of claim 1.

31. (Amended) A tandem-linked polyamide of claim [10,] 1 having the formula:



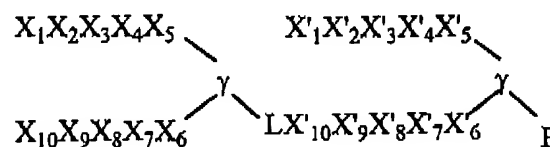
wherein γ is a chiral hairpin linkage derived from R-2,4-diaminobutyric acid;

X_1/X_{10} , X_2/X_9 , X_3/X_8 , X_4/X_7 , X_5/X_6 , X'_1/X'_{10} , X'_2/X'_9 , X'_3/X'_8 , X'_4/X'_7 , and X'_5/X'_6 represent ten carboxamide binding pairs which bind DNA base pairs wherein at least one binding pair is Hp/Py or Py/Hp and the other binding pair(s) is(are) selected from the group consisting of Py/Im, Im/Py, and Py/Py to correspond to the DNA base pair in the minor groove to be bound;

L represents an amino acid linking group selected from the group consisting of β -alanine and 5-aminovaleric acid (δ); and

wherein P represents zero to eight polyamides of claim 1.

32. (Amended) A tandem-linked polyamide of claim [10,] 1 having the formula:



wherein γ is a chiral hairpin linkage derived from R-2,4-diaminobutyric acid;

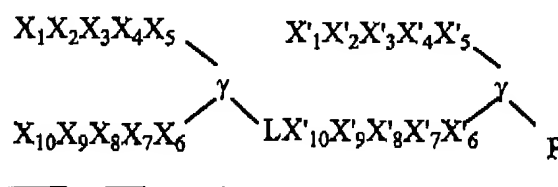
X_1/X_{10} , X_2/X_9 , X_3/X_8 , X_4/X_7 , X_5/X_6 , X'_1/X'_{10} , X'_2/X'_9 , X'_3/X'_8 , X'_4/X'_7 , and X'_5/X'_6 represent ten carboxamide binding pairs which bind DNA base pairs wherein at least one

binding pair is Hp/Py or Py/Hp and the other binding pair(s) is(are) selected from the group consisting of Py/Im, Im/Py, and Py/Py to correspond to the DNA base pair in the minor groove to be bound;

L represents an amino acid linking group selected from the group consisting of β -alanine and 5-aminovaleric acid (δ); and

wherein P represents zero to six polyamides of claim 1.

33. (Amended) A tandem-linked polyamide of claim [10,] 1 having the formula:



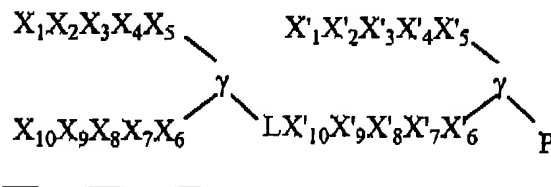
wherein γ is a chiral hairpin linkage derived from R-2,4-diaminobutyric acid;

X_1/X_{10} , X_2/X_9 , X_3/X_8 , X_4/X_7 , X_5/X_6 , X'_1/X'_{10} , X'_2/X'_9 , X'_3/X'_8 , X'_4/X'_7 , and X'_5/X'_6 represent ten carboxamide binding pairs which bind DNA base pairs wherein at least one binding pair is Hp/Py or Py/Hp and the other binding pair(s) is(are) selected from the group consisting of Py/Im, Im/Py, and Py/Py to correspond to the DNA base pair in the minor groove to be bound;

L represents an amino acid linking group selected from the group consisting of β -alanine and 5-aminovaleric acid (δ); and

wherein P represents zero to four polyamides of claim 1.

34. (Amended) A tandem-linked polyamide of claim [10,] 1 having the formula:



wherein γ is a chiral hairpin linkage derived from R-2,4-diaminobutyric acid;

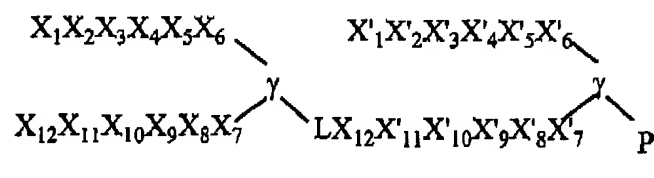
wherein γ is a chiral hairpin linkage derived from R-2,4-diaminobutyric acid;

X_1/X_{12} , X_2/X_{11} , X_3/X_{10} , X_4/X_9 , X_5/X_8 , X_6/X_7 , X'_1/X'_{12} , X'_2/X'_{11} , X'_3/X'_{10} , X'_4/X'_9 , X'_5/X'_8 and X'_6/X'_7 represent twelve carboxamide binding pairs which bind DNA base pairs wherein at least one binding pair is Hp/Py or Py/Hp and the other binding pair(s) is(are) selected from the group consisting of Py/Im, Im/Py, and Py/Py to correspond to the DNA base pair in the minor groove to be bound;

L represents an amino acid linking group selected from the group consisting of β -alanine and 5-aminovaleric acid (δ); and

wherein P represents zero to six polyamides of claim 1.

37. (Amended) A tandem-linked polyamide of claim [11,] 1 having the formula:



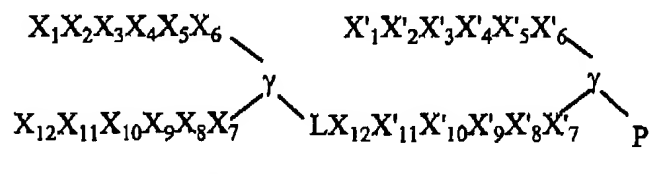
wherein γ is a chiral hairpin linkage derived from R-2,4-diaminobutyric acid;

X_1/X_{12} , X_2/X_{11} , X_3/X_{10} , X_4/X_9 , X_5/X_8 , X_6/X_7 , X'_1/X'_{12} , X'_2/X'_{11} , X'_3/X'_{10} , X'_4/X'_9 , X'_5/X'_8 and X'_6/X'_7 represent twelve carboxamide binding pairs which bind DNA base pairs wherein at least one binding pair is Hp/Py or Py/Hp and the other binding pair(s) is(are) selected from the group consisting of Py/Im, Im/Py, and Py/Py to correspond to the DNA base pair in the minor groove to be bound;

L represents an amino acid linking group selected from the group consisting of β -alanine and 5-aminovaleric acid (δ); and

wherein P represents zero to four polyamides of claim 1.

38. (Amended) A tandem-linked polyamide of claim [11,] 1 having the formula:



wherein γ is a chiral hairpin linkage derived from R-2,4-diaminobutyric acid;

X_1/X_{12} , X_2/X_{11} , X_3/X_{10} , X_4/X_9 , X_5/X_8 , X_6/X_7 , $\text{X}'_1/\text{X}'_{12}$, $\text{X}'_2/\text{X}'_{11}$, $\text{X}'_3/\text{X}'_{10}$, X'_4/X'_9 , X'_5/X'_8 and X'_6/X'_7 represent twelve carboxamide binding pairs which bind DNA base pairs wherein at least one binding pair is Hp/Py or Py/Hp and the other binding pair(s) is(are) selected from the group consisting of Py/Im, Im/Py, and Py/Py to correspond to the DNA base pair in the minor groove to be bound;

L represents an amino acid linking group selected from the group consisting of β -alanine and 5-aminovaleric acid (δ); and

wherein P represents zero to two polyamides of claim 1.